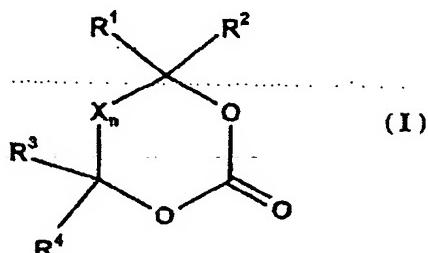


Claims:

1. A process for the catalytic hydroformylation of olefinically unsaturated compounds having from 3 to 24 carbon atoms using an unmodified catalyst comprising at least one metal of groups 8 to 10 of the Periodic Table of the Elements, wherein the hydroformylation is carried out in the presence of a cyclic carbonic ester of the formula I



where

R^1, R^2, R^3, R^4 are identical or different and are each H or a substituted or unsubstituted aliphatic, alicyclic, aromatic, aliphatic-alicyclic, aliphatic-aromatic or alicyclic-aromatic hydrocarbon radical having from 1 to 27 carbon atoms,

15 n is 0 - 5

20 X is a divalent substituted or unsubstituted, aliphatic, alicyclic, aromatic, aliphatic-alicyclic or aliphatic-aromatic hydrocarbon radical having from 1 to 27 carbon atoms,

25 with the proportion of the carbonic ester being at least 1% by weight of the reaction mixture.

- 30 2. The process as claimed in claim 1, wherein R^1, R^2, R^3, R^4 and X are substituted by identical or different substituents selected from among O, N, NH, N-alkyl and N-dialkyl radicals, fluorine,

chlorine, bromine, iodine, -OH, -OR, -CN,
-C(O)alkyl or -C(O)O-alkyl.

3. The process as claimed in claim 1 or 2, wherein
5 the hydroformylation is carried out in the presence of from 5 to 50% by weight, based on the reaction mixture, of a solvent which is nonpolar compared to the cyclic carbonic ester I and is immiscible with the cyclic carbonic ester I.
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4. The process as claimed in any of claims 1 to 3, wherein the reaction product from the hydroformylation is extracted with a nonpolar solvent which is immiscible with the cyclic carbonic ester I.
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5. The process as claimed in claim 3 or 4, wherein substituted or unsubstituted hydrocarbons having from 10 to 50 carbon atoms or olefins having from 20 3 to 24 carbon atoms are used as nonpolar solvent.
6. The process as claimed in any of claims 1 to 5, wherein the hydroformylation is carried out in the presence of $\text{HRh}(\text{CO})_3$ as catalyst.
25
7. The process as claimed in any of claims 1 to 6, wherein the reaction product mixture from the hydroformylation reaction is separated into a fraction comprising predominantly the catalyst and the cyclic carbonic ester and a fraction comprising predominantly the hydroformylation products.
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8. The process as claimed in any of claims 1 to 7, wherein the fraction comprising the catalyst is recirculated to the hydroformylation reaction.
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9. The process as claimed in any of claims 1 to 8, wherein the cyclic carbonic ester used is ethylene carbonate, propylene carbonate or butylene carbonate or a mixture thereof.

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10. The process as claimed in any of claims 1 to 9, wherein the unreacted olefinically unsaturated compounds are separated off from the reactor output or from the hydroformylation products and are returned to the same hydroformylation reaction or passed to a second hydroformylation reaction.

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11. The process as claimed in any of claims 1 to 10, wherein the olefinically unsaturated compounds used are compounds which have been obtained as unreacted olefinically unsaturated compounds from the reactor output of a first hydroformylation reaction.

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12. The process as claimed in claim 11, wherein the olefinically unsaturated compounds used are compounds which have been obtained as unreacted olefinically unsaturated compounds from the reactor output of a first hydroformylation reaction carried out in the presence of a ligand-modified catalyst.

(initials)